European Journal of Business and Management
ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online)
Vol.7, No.13, 2015
www.iiste.org

The Determinants of the Commercial Banks Profitability in Tanzania: Panel Evidence

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Abstract
This paper examines determinants of commercial banks profitability in Tanzania with a particular focus on the internal and external factors. The study employs a set of panel secondary data from a sample of eighteen (18) commercial banks for the period (2000-2011) and uses CAMEL model to investigate the financial performance level of the banking system. Furthermore, The study employs multiple regression model to generate and specify the profitability function. The results confirm that capital adequacy, liquidity, asset quality and macro-economic factors are critical components in influencing profitability of the commercial banks.
Keywords: Profitability, Multiple Regression, Commercial Banks

1. Introduction

The world economic crunch of 2008 that originated in the USA and which is considered to be the worst crisis since the Great Depression has proved that a sound and profitable banking sector is essential for the overall financial stability of any economy operating under a bank-based financial system. Tanzania as a developing country has a banking industry which is growing each year due to the increase in the number of people holding bank accounts. The Tanzanian Banking Sector Annual Report (2009) revealed that there has been a healthy growth in the number of people who use banking services in the country. The report also reveals that over a period of three years (2006-2009), the population has grown by 10%, while the number of people holding bank accounts has grown by 33%. This shows that the banking industry within Tanzania shows promise to the banks and the overall economy.

The Tanzanian banking industry is comprised of over 35 commercial banks which differ in size and years of service. Though the banking industry shows promise, some banks report increased profits each year while others report losses. Finscope (2009) depicted that there is a 22% increase in people who used to use banks for savings, deposits, investments and loans but they do not now use banks which may be a lost contribution to banks. The survey identified the obstacles to access finance as; the perception that loans are irrelevant, hard to get or too difficult to repay, lack of enough money to save and lack of knowledge on banking services and products. These factors may affect the commercial banks' profitability in Tanzania. This study evaluates the determinants of profitability for Tanzanian banks using the bank-specific factors and macro-economic factors.

Profitability in commercial banks is determined by the ability of the banks to retain capital, absorb loan losses, support future growth of assets and provide return to investors. The largest source of income to these banks is the interest income which is earned through lending activities less interest paid on deposits and debt (Xuezhi, 2012). Bank of Tanzania (2007) has set some standard measures of profitability such as: Return on equity (ROE) which directly reflects corporate competitiveness strength and sustainable growth. It is an important indicator to show the attractiveness of the equity to the investors. The other one is Return on Assets (ROA) which effectively reflects corporate profitability which can be used to evaluate the performance of management in the utilization of the assets. To compute this, net income is divided by average value of total assets over the same period. This calculation is intended to measure bank efficiency using its assets as a measurement. Net interest income to average interest bearing assets; this ratio is calculated by taking total interest income less total interest expenses divided by average of the bearing asset (Xuezhi,2012).

This study was conducted as follows; first a sample of 18 banks was chosen to analyze the determinants of banks' profitability over a period of twelve (12) years (2000 - 2011) making 216 observations. Second, the bank specific (internal) and macro economic factors which determine the bank's profitability were established, these factors were obtained from similar studies conducted in other countries and from various literature pertaining to this topic. Third, regression analysis was done to establish the relationship between the dependent variable which is the bank's profitability and the independent variables as they were shown in the literature and the proposed regression model.

The objective of this paper is to establish the macroeconomic and bank specific (internal) determinants of profitability for Tanzanian banks during the period between (2000-2011) using 216 observations. The remainder of this paper is organized as follows; part two (2) reviews literature about the determinants of banks' profitability which includes studies conducted in other countries and theories about this topic. Part three explain the methodology of the study, part four illustrates the main findings of the study and finally part five (5) provides conclusions and recommendations.

1.1 Overview of Commercial Banks in Tanzania.

The evolution of the banks in Tanzania is categorized into five sections, 1. The German rule, 2. British rule, 3. Post-independence before Arusha declaration, post Arusha declaration, and after 5. Arusha Declaration to present.

The start of commercial banking in Tanzania began in 1905 when the bank of Berlin known as Deutsch-Ostafricanische open-ended their branch in Dar es Salaam. The bank was authorized to perform central banking functions such as the issue of currency and bank of the government (Kimei, 1987), the second bank was Handles bank which was opened in Tanga in 1911, Tanga was a strategic area where it was possible for the bank to mobilize savings due to higher economic activities performed within the region.

However after the defeat of Germany in the First World War, Germany lost control of Tanganyika, as a result its banks collapsed and British banks were established these consisted of The national and Grind lays bank which was the combinations of the lays bank, National bank of India, and south Asia Lloyd bank, The standard bank and the Barclays bank which was the combination of British colonial bank, Anglo Egyptian bank and the national bank of South Africa. Also, the Bank of India was established in 1953 and Bank of Baroda in 1954.

Later on the Ottoman Bank and Commercial Bank of Africa were established in 1958 and 1961 respectively. These banks operated in DSM, Moshi, Mwanza, Kigoma and Lindi. All these banks were established to save the interests of the owners and their primary initiative was to establish profit maximizations. The East African currency board was established to control the supply and control of currency.

After the attainment of independence, the operations of the bank remained the same, and rules and regulations were maintained from their home countries. However these rules and regulations were not compatible with the economic growth of the nation, since more directives and supervision came from their home countries (Nyirabu, 1980). Following that weakness the central government of east African countries invited an expert from the German Federal Bank, Dr Edwin Blumenthal to do a study of the east African monetary system and to provide reccomendations. The recommendations were composed of a two (2) tier system and separated the banks into the three (3) states and established the central bank (Report of Government of Tanganyika, 1963). During this period, the IMF and World Bank advised the three states to establish the central bank which would be supervising the monetary issues of the separate states. As a result the Bank of Tanzania was created by the Act of parliament and started functioning in 1966 (Kimei, 1987).

During this period another three (3) banks were created these were The National Cooperative Bank ltd (1964), National Bank of Commerce (1965) and Peoples Bank of Zanzibar. The banks were not operating properly due to foreign dependence on metropolitan head offices. There were little saving mobilizations, discriminatory loan security requirements, a low level of finance to the domestic sectors, etc

Due to the above weakness the government of Tanzania adopted the Arusha Declaration where most banks were nationalized to promote the national interest. The policy of socialism self reliance mandated the government to replace all the commercial banks and to adopt a national policy. Some of the commercial banks taken over by the government were Bank of Baroda, Barclays Bank, National and Grid Lays Bank, Bank of India, Standard Bank Ltd, etc.

In 1971, National Cooperative Bank and NBC were operating on the mainland and Zanzibar. This banking system proceeded up until 1984 where the Tanzania Cooperative Bank was categorized into rural and development bank. This occurred because the government proved the role of cooperative in the economy (CRDB restructuring report, 1988). CRDB was established to facilitate the national cooperative in the economy of Tanzania. It's main mandate was to deal with providing credit to the cooperative unions most of which were located in rural areas.

The performance of the banks continued to be poor, to the point that the level of non-performing loans were very high, due to this problem loan and Advances and realization trust was set to take over and realize the non-performing loans of NBC and CRDB (Bank of Tanzania, loan and advance and realization trust act of 1991)

Following poor performance of the banks, the banks were restructured, CRDB was structured and fully privatized in 1996, while NBC was split into three entities NBC (1997), The national Microfinance Bank (NMB), and the consolidating holding corporation limited NBC (1997) limited was privatized and renamed in 1st April, 2000 when the government sold a 70% stake to ABSA group from South Africa.

In the end of January 2004, there were 19 commercial banks, 2 cooperative banks, 4 community banks and 6 non-bank financial institutions operating the banking business in Tanzania.

After privatizations many banks joined the industry both local and foreign, the trend of mushrooming was very high. The industry had various players, these includes fully fledged banks (21), regional banks (5), financial institutions (5), Bureau de change (102). (BOT, 2005)

According to Bank of Tanzania (2014), there are currently 34 commercial banks operating in the country.

2. Literature Review

Various researchers have studied the issue of determinants of banks' profitability both theoretically and empirically.

2a. Theoretical Literature review

Several authors have narrated the determinants of banks' profitability in a theoretical capacity. The most common company specific (internal determinants) and macroeconomic determinants are as follows;

Internal Determinants

Capital Adequacy

It has been depicted that highly capitalized banks should have high profits compared to those which are lowly capitalized. The main reason for this is the presence of bankruptcy costs, for a bank that is capitalized below its equilibrium ratio, the expected bankruptcy costs are relatively high, and an increment in capital ratios boosts the expected profits by lowering interest expenses on uninsured debt (Berger, 1995).

Staikouras & Wood (2003) and (Abreu & Mendes, 2001) have shown that there exists a positive correlation between capital adequacy and profitability. This positive relationship is necessary for the bank to fund its assets at more favorable interest rates, increasing expected profits and offsetting the cost of equity, which is considered to be the most expensive bank liability in terms of expected return (García-Herrero et al., 2009).

Asset Quality

Alexiou and Sofoklis (2009), DeYoung and Rice (2004), Chiorazzo et al. (2008) portray that bank profitability is directly related to the quality of the assets shown on the statement of financial position. For instance; poor quality of credits/loans has a negative impact on the banks' profits. They have further shown that this correlation exists because an increase in the assets of poor quality requires a bank to allocate a significant portion of its gross margin to provisions to cover expected credit losses; this lowers the banks' profits.

Liquidity

Liquidity in banks plays a major role in determining their profitability; this is due to the fact that lack of sufficient liquidity is one of the major reasons for bank failures. Bourke (1989) narrated that holding liquid assets has an opportunity cost of higher returns and there exists a strong positive significant link between bank liquidity and profitability. However, in times of instability banks may chose to increase their cash holding to mitigate risk.

Cost/Expenditure

Abreu & Mendes (2001) narrate that a bank's operating costs are expected to have a negative correlation with profitability and the level of operating expenses is viewed as an indicator of the management's efficiency. This negative correlation between operating costs and profitability exists measures despite their positive effect on net interest margins.

Macroeconomic Determinants

Inflation

Ravel (1979) portrayed that inflation is a significant macroeconomic determinant of bank's profitability. The impact of inflation on the bank's profits depends on whether bank's salaries and operating expenses increase faster than that of the inflation rate. So, the effect of inflation is dependent on the overall macroeconomic stability that allows the correct prediction of inflation.

The relationship between inflation and banks profitability is dependent on whether the inflation is fully anticipated by a bank's management. If the inflation rate is fully anticipated by the bank's management, the bank can adjust interest rates appropriately to increase revenues faster than costs, which should have a positive impact on profitability (Perry, 1992).

Interest Rate

An economy characterized by low interest rates and stiff competition among banks could limit the possibilities for banks to establish appropriate prices for their credit facilities and deposits, putting pressure on the operating margin and negatively affecting banks' profitability. Demirguç- Kunt& Huizinga (1999), Claeys & Vennet (2008), Molyneux & Thornton (1992) have all narrated that there is a positive relationship which can be seen between interest rates and a bank's profits.

2b. Empirical Literature Review

Several studies have been conducted in various countries about the determinants of banks profitability. Naceur, (2003) investigated the determinants within the Tunisian banking industry profitability for the period from (1980 – 2000); he found that high net interest margin and profitability are associated with banks that are highly capitalized, and who have large overheads. It was also found that the macro-economic indicators such inflation and growth rates have no impact on a bank's interest margins and profitability.

The other study was conducted investigating the company specific determinants of banks' profitability in Pakistan over the period 2004-2008. The paper used the pooled Ordinary Least Square (POLS) method to investigate the effect of assets, loans, equity, and deposits on one of the major profitability indicator return on asset (ROA). The empirical results provided strong evidence that these variables have a strong impact on the profitability. However, the findings show that higher total assets may not necessarily lead to higher profits due to diseconomies of scales. Also, higher loans contribute towards profitability but their impact is not significant. Equity and Deposits have significant impact on profitability (Javaid et al, 2011).

Athanasoglou *et al.* (2006) carried out a study on the determinants of bank profitability in the South eastern European region using the credit institutions for the period (1988-2002). The findings showed that all bank specific determinants have a significant impact on a bank's profitability. The macroeconomic determinants showed a mixed impact on profitability.

Uhomoibhi, (2008), conducted a research investigating the determinants of bank profitability in Nigeria. The study was intended to econometrically identify significant macroeconomic determinants of bank profitability. A panel data set which was comprised of 1255 observations of 154 banks over the period from (1980-2006). The regression analysis was performed and the results showed that real interest rates, inflation, monetary policy, and exchange rate regime are significant macroeconomic determinants of bank profitability in Nigeria. The findings also showed that the banking sector development, stock market development, and financial structure have insignificant impact on profitability.

Another study was conducted by (Nguyen, 2011) about the market concentration and other determinants of bank profitability using evidence from 28 financially liberalized countries in the periods from (1997 – 2004). The results after performing regression analysis suggested that both Return on Equity (ROE) and Pre-tax Profit are strongly related to the levels of capital adequacy, expense ratio, credit risk, and net interest income. It was also found that ROE and Pre-tax profits are positively related to capital adequacy and non-interest income.

3. The Methodology of the study

The agreement on literature of the methodology on the determinant of bank profitability was found through the use of the functional form of the equation which follows the generalized linear equation model. There are thousands of papers that have followed the functional form that tend to measure the determinant of banks profitability: see Molyneux (1994), Schumacher etal (2009), Davydenko (2010), Haron (2004) and etc. This study is not an exception it therefore follows the same footprints of the above studies using the context of the Tanzanian environment with the adjustments made on the determinants of the profitability. The model is based on the financial structure, macroeconomic variables and bank specific factors that affect the level of profitability. The financial structure is based on CAMEL, which means Capital adequacy, Assets Quality, Management Capability, Earnings, Liquidity and Sensitivity. The macro economic variables are inflation and interest rate and the bank specific characteristics are size of the bank and interest rate spread. The study adopted panel secondary data from the respective banks; panel data is suitable as it composes both time series and cross sectional data hence meeting the objective of the study. The ratio was computed through excel and then run through Eviews to find the results. The data obtained was assumed to be cleaned and reliable for studies since the balance sheet and income statements have been audited by the external auditors and are suitable for public consumption as is the requirement of the bank of Tanzania.

Moreover the study adopts the econometric approaches such as Panel Least Squares (PLS), Fixed effect (FE), Panel EGLS (Cross-section random effects) since the data involved panel data estimation.

3.1 The internal determinants

Capital adequacy indicates the percentage of the capital of the bank; it includes core capital to RWA, core capital to average assets and total capital to RWA. Capital adequacy was chosen because the well capitalized banks indicate higher profitability and it faces low cost of bankruptcy. According to Berger (1995) indicated that a well-capitalized bank is very profitable and faces low cost of bankruptcy and attracts a wide range of depositors.

Asset quality is comprised of Non-performing loan to Gross loan, large exposure to core capital and Non-performing loan net of provision to core capital. Asset quality in terms of the greater number of loan loss provision will lower the profitability of the bank, on the other hand there is different mix in terms of loan ratio meaning that the higher the ratio the greater the revenue while the other scenario indicates the higher the ratio the bank can face the probability of defaults. In general the asset quality is expected to bring a positive sign other than a ratio of loan loss provision.

Liquidity is composed of core capital to total funding, liquid asset to demand liabilities and Gross loan to total deposit. The higher level of liquidity is the prerequisite for the profitability of the bank. The higher level of liquidity indicates that the bank will be able to meet its current obligation in the course of doing business hence increasing the profitability. Meanwhile there will be a low level of liquidity meaning that the banks have

very little cash to suffice hence low profitability. Althanasoghou (2006) indicated that liquidity is the source of the bank's profitability; it can accommodate the decrease in liabilities and finance the increase in banking assets. However too much liquidity is not good for the bank as there is a cost to keeping cash hence decreases profitability, further more too much cash and idle cash earn nothing, it's better to be re invested which increases profitability.

The macro economic variables include interest rate and inflation. In theory they tend to increase the profitability as they in turn increase. Bank specific factor includes the size of the bank and the interest spread. Both of them once they increase tend to increase the profitability of the bank and once they are low they tend to decrease the profitability of the bank, spread is measured by the difference between the deposit rate and the loan rate, the bank size is measured in terms of market share of each individual bank.

$$y_{it} = a_0 + \sum_{i=1}^{n} B_n X_n + \sum_{i=1}^{n} C_n Z_n + \sum_{i=1}^{n} r_n p_n + D + \gamma \quad \text{..... (1)}$$

$y_{it} =$ Dependent variable

$a_0 =$ Intercept

$X_n, C_n, P_n =$ Independent variables

$X_n =$ Internal factors affecting profitability

$C_n =$ Bank specific factor

P_n =Macro-economic variable

μ =stochastic error

Bank 1: $y_{it} = a_0 + B_1 X_n + C_1 Z_n + r_1 p_n + D + \mu$ 2

Bank 2: $y_{it} = a_0 + B_2 X_n + C_2 Z_n + r_2 p_n + D + \mu$ 3

Bank n: $y_{it} = a_0 + BnX_n + CnZ_n + rnp_n + D + \mu$ .....n

$y_{it} =$ ROA, NIM and NOVX as a measure of profitability

D= represent dummy variable for small and large banks

Description of variables (determinants of bank profitability)		**notation**	**symbol**
Dependent variable Profitability	Measured by return on Asset	ROE NIM NEVEX	y
1.capital adequacy	1. Core capital to R_{WA} 2.Core capital to average Asset 3.Total capital to R_{WA}	CCR_{WA} CCA TCR_{WA}	X_1 X_2 X_3
2.liquidity	1.core capital to total funding 2.liquid asset to demand liabilities 3.Gross loan to total deposit	CCTF LADL GLTD	X_4 X_6 X_7
3.Asset quality	1.Non performing loan to Gross loan 2.Large exposure to core capital 3.Non performing loan net of provision to core capital	NPlGl Lecc NPccc	X_8 X_9 X_{10}
4.Expeditures	Total expenditures (both interest and operational expenditure)	TEOP	X_{11}
Macroeconomic variable			
5.Inflation	Inflation measured by CPI	IF	p_1
6.Interest rate	Interest rate charged to customers	IT	p_2
7.Bank specific factor- size	Market share of the bank	Ms	c_1

4. THE RESULTS OF THE FINDINGS

This study was meant to investigate the determinant of bank profitability specifically by looking at the internal and external determinants.

4.1 Descriptive statistics

This entails the variables that have been used for the study and generally show the dimensions of the sample. The variables was used to find the determinants of bank profitability and the total number of cases was 304 which depicts a very large sample and the general conclusion drawn from the findings can be generalized .

Table 1: showing descriptive statistics of the determinants of bank profitability

Descriptive Statistics									
	N	Minimum	Maximum	Mean	Std. Devia	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
CCRWA	304	-140.66%	576.05%	32.85%	59.18%	4.826	0.14	32.522	0.279
CCA	304	-32.96%	92.22%	16.15%	16.59%	1.841	0.14	5.656	0.279
TCRWA	304	-140.66%	3200.00%	43.37%	191.02%	15.12	0.14	248.321	0.279
NPlGl	304	-682.69%	2324.58%	67.11%	190.05%	6.697	0.14	71.47	0.279
Lecc	304	-370.54%	2365.41%	8.10%	146.94%	13.695	0.14	220.43	0.279
NPccc	304	0.00%	73.83%	5.49%	10.28%	3.323	0.14	14.328	0.279
CCTF	304	2.80%	113.45%	51.27%	23.90%	0.085	0.14	-0.908	0.279
LADL	304	7.34%	1574.78%	65.12%	105.93%	10.834	0.14	142.159	0.279
GLTD	303	0.00%	140.56%	55.72%	24.54%	0.169	0.14	0.66	0.279
IF	304	4.30%	19.80%	9.50%	5.09%	0.859	0.14	-0.505	0.279
IT	304	14.40%	19.60%	15.73%	1.15%	2.114	0.14	5.057	0.279
LEND	304	2.39%	4.20%	2.72%	0.45%	2.193	0.14	4.094	0.279
SPR	304	11.90%	16.10%	13.01%	0.85%	1.242	0.14	2.088	0.279
ROA	301	-39.07%	500.00%	2.28%	29.34%	16.353	0.14	278.582	0.28
Valid N (li	300								

CCRWA-(core capital to RWA), CCA - (core capital to average assets), Total capital to RWA), LECC (Large exposure to core capital), NPLG (Non-performing Loan to Gross loan), CCTF (Core deposit to total funding), *LADL (Liquid asset to demand liabilities), GLTD (Gross loans to total deposit), Total expenditure*

4.2 Model fit

This entails the assumption of the relationship between the dependent variable and independent variables to have existed. In this case R Square and Adjusted R Square were taken into consideration. The dependent variables used was ROA (Return on Asset), Net interest income to average earning asset (NIM) and Non-interest expenses to average assets (NOVX).

The results from the regression model indicates the values of R square and adjusted R square both was fitted on the model, they were 72% and 68% respectively for ROA. However when net interest income and Non-interest income was regressed against the explanatory variables they showed 63% and 62% for R square and adjusted R square respectively. NIM recorded R square and adjusted R square of 80% and 78% respectively.

Table 2: Model summary

	ROA	NIM	NOVX
R square	72%	80%	63%
Adjusted R square	68%	78%	62%
F statistic	84.2	46	20
Significance at 5%	0.002	0.004	0.000
DW (Durbin Watson)	2.209944	2.220232	2.677313

4.3 Summary of the regression results

The dependent variables ROA (Return on Asset), Net interest Margin (NIM) and Non-interest expenses to Total income (NOVX) was measured by three different time series model, fixed effects , Random effects and panel least square estimates.

Case one: ROA as a dependent variable

The three (3) adopted models showed capital adequacy, asset quality, liquidity inflation, and interest and market share to have significant impact in explaining the profitability of the banks. Total expenditure has not been significant in explaining the impact of the profitability with all three time series model. Capital adequacy and asset quality determinants have showed the negative sign with the dependent variable. Liquidity and market share have shown the positive impact on the return on asset and the results was statistically significance.

Panel Least Squares (PLS), Fixed effect (FE), Panel EGLS (Cross-section random effects) results ROA as a dependent variable

Variable	PLS Coefficient	FE coefficient	RE coefficient
C	-0.055537	0.290087	-0.055537
CCA	-0.211723**	-0.200304**	-0.107173**
CCRWA	-0.129798**	-0.105805**	-0.109798**
Ms	0.122506***	-0.104319**	0.100506***
GLTD	-0.104737**	0.059782**	-0.400737**
IF	0.15784***	-0.237824	0.157842
IT	0.510067	-1.857741**	0.510067**
LADL	0.102625****	0.203904**	0.102625**
LECC	-0.002097	0.000725	-0.002097
NPCCC	-0.074548*	-0.050282***	-0.074548*
NPLGL	-0.122657***	0.102714**	0.112657**
Toexp	-0.000901	-0.001491	-0.000901
T			
R square	72%	80%	73%
Adjusted R sqr	68%	78%	66%
Durbin Watson	2.209944	2.220232	2.352848

Case two:

Panel Least Squares (PLS), Fixed effect (FE), Panel EGLS (Cross-section random effects) results NIM as a dependent variable.

Core capital to average asset, market share, inflation, total, expenditure, gross loan to total deposit and liquid asset to demand liability have been statistically significance influenced positively the profitability of the bank. Interest rate, core capital to risk weighted and Non-performing loans have impacted negatively the profitability of the bank. Total expenditure was not significance when measured by random effects and fixed effects model.

Variable	PLS Coefficient	FE coefficient	RE coefficient
C	-0.022611	0.798609	-0.022611
CCA	0.174390**	0.280698***	0.274390**
CCRWA	-0.313863*	-0.207050	-0.213863
Ms	0.231678*	0.353261	0.331678*
GLTD	0.285800*	0.442130**	0.285800*
IF	0.977102	7.414489***	1.977102**
IT	-0.560285	-9.117897**	-0.560285**
LADL	0.102504**	0.111887**	0.102504*
LECC	-0.003726	-0.003382	-0.003726
NPCCC	0.296724	0.208184	0.296724
NPLGL	-0.326428***	-0.101370**	-0.206428**
Toexp	0.000462*	0.001709	0.000462
R square	72%	80%	63%
Adjusted R sqr	68%	78%	61%
Durbin Watson	2.220232	2.414854	2.352848

** 1% significance, ** 5% significance, ***10% significance*

Case three:

Panel Least Squares (PLS), Fixed effect (FE), Panel EGLS (Cross-section random effects) results NOVX as a dependent variable

Capital adequacy, market share, interest rate and liquid to demand liabilities have been significance in estimating profitability of the banks for the three models. On other hand total expenditure has influenced positively profitability of the banks although the results were found not to be significance. Asset quality measured by Non-performing loans and inflation has negatively influenced the profitability of the banks and the result was statistically significance.

Variable	PLS Coefficient	FE coefficient	RE coefficient
C	0.036734	-0.315744*	-0.159637**
CCA	0.100715*	0.102878*	0.129800**
CCRWA	0.107446*	0.091581*	0.001199
Ms	0.033818**	0.029513	0.035873***
GLTD	0.026077***	-0.103218**	0.105178**
IF	-0.154573***	0.802901***	0.177780
IT	0.341091*	1.993705**	1.258570**
LADL	0.106309*	0.104372***	0.104260**
LECC	-0.001903	0.000178	5.23E-05
NPCCC	-0.011373	-0.020910	-0.015883
NPLGL	-0.100445*	0.100646*	0.100642***
Toxpe	0.000463	0.000716	0.000724
R square	63%	68%	78%
Adjusted R sqr	62%	64%	74%
Durbin watson	2.677313	2.420232	2.240606

** 1% significance, ** 5% significance, ***10% significance*

Multicollinearity is the situation where two (2) or more independent variables have linear relationship, by rule of thumb bivariate correlation should not be greater than 0.8. most bivariate correlation have value below 0.8 which indicates the absence of correlation between the variables under the study **.**It can be noted that the independent variables have very weak correlation between each other and hence they have good ability to predict the dependent variables, hence they are independent in influencing bank profitability. All correlation has been insignificance effect at 5% level.

Table 3: Correlation among the independent variables

	Ccrwa	cca	Ms	Nplgl	Lecc	Npccc	Cctf	Ladl	Gltd	Teox	If	It
Ccrwa	1.000											
Cca	.032	1.000										
Ms	.021	.280	1.000									
Nplgl	-.012	.490	.222	1.000								
Lecc	-.205	.276	.056	.330	1.000							
Npcc	-.202	.234	.287	.206	.079	1.000						
Cctf	.023	-.402	.005	.303	.114	.405	1.000					
Ladl	.005	.037	.111	.209	.090	.890	.723	1.000				
Gltd	.068	.199	.120	.245	-.005	.408	.800	.223	1.000			
Teox	.017	.086	.029	.503	.204	.319	.610	.192	.584	1.000		
If	.028	.090	.450	.880	.440	.720	.250	.330	.709	.670	1	
It	.390	.910	.670	.706	.560	.690	.130	.270	.224	.505	.103	1

CCRWA-(core capital to RWA), CCA - (core capital to average assets), Ms-market share), LECC (Large exposure to core capital), NPLG (Non-performing Loan to Gross loan), CCTF (Core deposit to total funding), LADL (Liquid asset to demand liabilities), GLTD (Gross loans to total deposit), Total expenditure

Another well familiar test of Multicollinearity is through the use of variance inflation factor it indicates how variance of an estimated regression coefficients have increased because of collinearity. The Multicollinearity has the problem of increasing the coefficients and making most of estimated variables to be unreliable. Therefore the only were to prohibit Multicollinearity is to adjust the element that increases the Multicollinearity. The

commonly Multicollinearity tolerance value (1/VIF) is 0.1, therefore VIF is supposed to be 10; in excess of this it indicates higher Multicollinearity.

Table 4: variance inflation Factor

Variables used	VIF	1/VIF (Tolerance)
Ccrwa	2.578	0.388
Cca	2.352	0.425
Tcrwa	2.238	0.447
Nplgl	2.851	0.351
Lecc	2.816	0.355
Npcc	2.729	0.366
Cctf	1.877	0.533
Ladl	1.623	0.616
Gltd	2.771	0.361
Teox	2.733	0.366
If (Inflation)	1.089	0.918
It	1.094	0.914

*CCRWA-(core capital to RWA), CCA - (core capital to average assets), Total capital to RWA), LECC (Large exposure to core capital), NPLG (Non-performing Loan to Gross loan), CCTF (Core deposit to total funding**),** LADL (Liquid asset to demand liabilities), GLTD (Gross loans to total deposit), Total expenditure*

Autocorrelation and Long run stability

Auto correlation is a situation where the error term is correlated in different periods; in this case it results into serial correlation. There so many test that are used in the detection of multiconearity. In this case the residual from the sample regression are not random hence violating Gauss –Markov assumption of covariance of error term which is supposed to be zero. For the case of this study Durbin Watson was used to test the presence of serial correlation. Using the DW test it was confirmed the data to have no autocorrelation hence suitable for running regression analysis as the value of DW was above 2 in all three selected models. Moreover the statistical results have indicated the variables to have long run relationship with the dependent variable as the probability of chi square was less than 5% level.

	ROA	NIM	NOVX
DW	2.209944	2.220232	2.677313

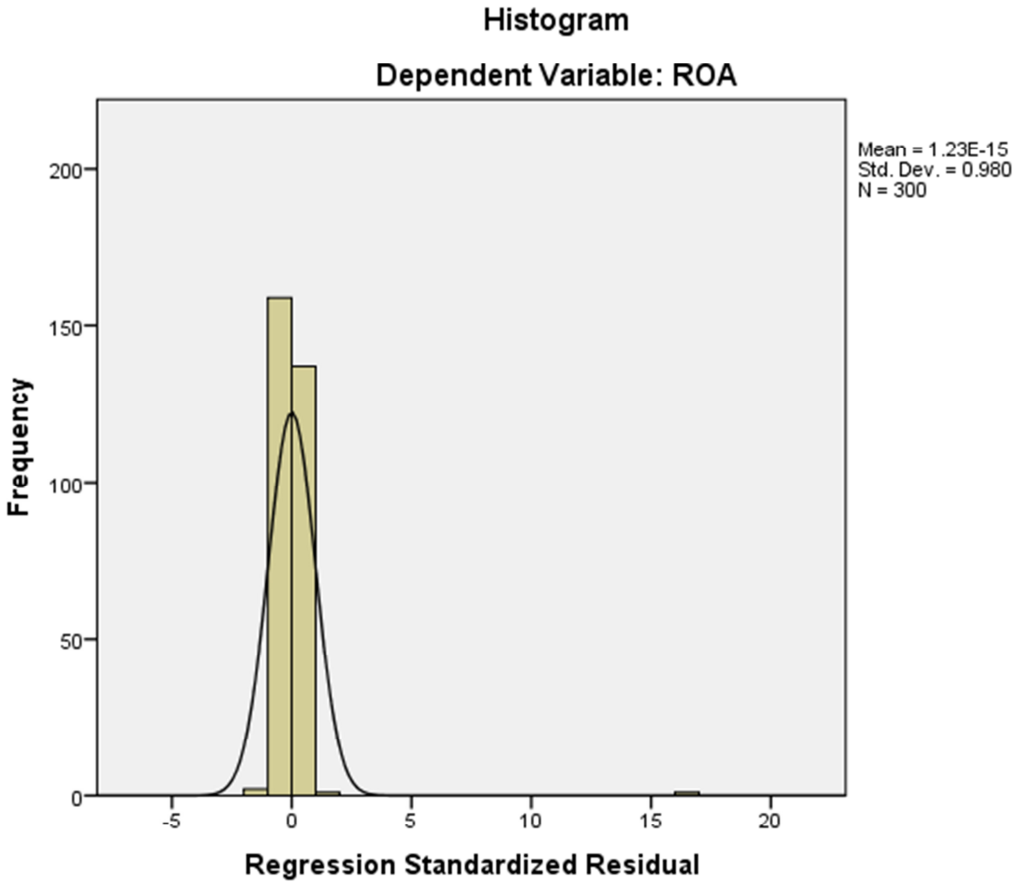
Panel unit root test: Summary
Series: RESID01
Date: 03/06/14 Time: 13:06
Sample: 2000 2011
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-14.3974	0.0000	18	216
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.17292	0.0000	18	216
ADF - Fisher Chi-square	101.525	0.0000	18	216
PP - Fisher Chi-square	118.851	0.0000	18	216

** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

Heteroskedasticity this refers to the situation when the variances of different observation is not constant, the general assumption of regression is that the variances of different observation must be constant. This is serious

problem as it can nullify the regression output and therefore need to be clearly checked. The heteroskedasticity can be checked by various approaches, but this study used the normal plot. It can be seen from the graph below the standardized residual are normally distributed and there was no outliers which can increase the chance for the presence of heteroskedasticity.



4.4 Analysis of CAMEL model

In this case different financial performance measure based on size, network, ownership and entry level was measured to see the best performing bank. With this large, small, domestic, foreign, public, private, wide network and limited network was established.

The analysis was based on capital adequacy, asset quality, management, earnings and liquidity

To start with **capital adequacy**, this shows how the bank is well capitalised for future growth and sustainability, in this case state owned banks were more capitalised, followed by the small and regional banks, limited bank by network , domestic bank, large banks and the least was the wide networks banks. In comparison of different banks by different characteristics small banks are more capitalised than large banks, state owned banks are more capitalised than the private banks, domestic banks are more capitalised than the foreign banks, and limited by networks banks are more capitalised than the wide network banks. Generally despite difference in capital adequacy between different groups of banks, all categories of banks meet the minimum requirements.

Asset quality indicates the ability of the assets to generate revenue, this is a great source of bank efficiency, state owned banks and small banks have higher share of non-performing loans to gross loan, followed by the limited by networks banks, foreign bank, domestic bank, private banks and the wide network bank, in this context it can be seen that the bank with higher , share capital adequacy has higher share of non-performing loans, this is in light with the study made by Xuezhi (2012) who noted that higher non-performing loans tend to force bank to keep higher share of capital adequacy. The findings are the same with regard to loan loss reserve to gross loan while on non-performing loan net of provision was higher for wide networks banks followed by large banks, private banks, small banks, foreign banks and then limited banks by networks. In general limited by networks banks was having good and strong asset quality, followed by foreign banks, small banks, private banks, state owned banks, large banks and the least was the wide networks banks. Therefore small banks was having higher and good asset quality than the large banks, foreign banks was having good asset quality than the domestic banks,

private banks was having higher asset quality than the state owned banks and lastly the limited by networks was having higher asset quality than the wide networks

Management's capability this indicates ability of management in managing asset and produce revenue; it is measured by total asset growth, earning growth and loan. Asset, earning and loan growth was higher for small banks, domestic banks, wide network banks, state owned banks, private banks, limited by network banks, large banks and the least was the foreign banks.

Earning, this measures the return from the generating assets, the key ratios are return on asset, interest income to earning assets, non-interest expenses to earning asset. Return on asset (ROA) was higher for large banks followed by domestic banks, wide network banks, private; limited by networks, foreign banks, state owned and the least was the small banks. Non-interest income to average earning asset was lower for foreign banks followed by limited by networks banks, small banks, private banks, large banks, domestic banks and the greatest value was dominated by the wide network bank. Non-interest expenses to total asset has been excellent for limited banks, followed by foreign banks, large banks, domestic banks, private banks, wide banks by network, small banks and the least was the state owned banks.

Generally large banks have higher earning level than small banks, private banks was having higher earning level than the state owned banks, the domestic banks was having higher earning level than the foreign banks and the wide network banks are more profitable than the limited banks by network.

Liquidity this indicates the ability of the banks to meet their short term obligation, in other case liquidity can be used for long term growth as it can be re invested. This can be measured by core deposit to total deposit, liquidity assets to demand liabilities and Gross loan to total deposit. In terms of core deposit to total deposit it was higher for the large banks, followed by domestic banks, then wide networks banks, private banks, foreign banks, state owned banks, limited by network banks and the least was the small banks, where in terms of liquid assets the state owned banks maintain the highest position, followed by large banks, domestic banks, private banks, limited by networks banks, wide by networks bank, foreign banks and the least was the small banks. In terms of gross loans to total deposit, the highest order was maintained by small banks followed by state owned banks, foreign banks, wide networks banks, limited by networks banks, private banks, domestic banks and the least was the large banks.

Generally small banks was more liquid than the large banks, state owned was liquid than the private banks, foreign banks was liquid than the domestic banks and wide network banks was liquid than the limited by network banks. All categories of banks meet the minimum requirements and they maintained their liquid position.

SUMMARY OF RATIOS								
RATIO	10 YEAR WEIGHTED AVERAGE							
	LARGE	SMALL	STATE OWNED	PRIVATE	FOREIGN	DOMESTIC	WIDE BRANCH NETWORK	LIMITED BRANCH NETWORK
Capital Adequacy Ratios								
Core Capital to RWA+OBS	17.79%	21.88%	31.64%	18.09%	17.35%	20.34%	17.16%	21.74%
Core Capital to Total Assets	9.95%	12.47%	16.93%	10.16%	10.51%	10.48%	9.65%	12.15%
Total Capital to RWA+OBS	18.18%	23.01%	31.64%	18.66%	18.06%	20.72%	17.51%	22.67%
Asset Quality								
NPLs to Gross Loans	7.63%	9.52%	12.71%	7.85%	8.58%	7.18%	7.28%	9.81%
NPLs net of provisions to Core Capital	19.41%	18.49%	11.82%	18.86%	16.76%	18.41%	20.20%	15.80%
Loan Loss Reserve to Gross Loans	3.36%	5.52%	7.55%	3.68%	4.75%	2.98%	3.21%	5.30%
Management Capability								
Total Assets Growth Rate	18.27%	27.49%	20.37%	19.96%	17.86%	22.81%	20.44%	19.67%
Loans Growth Rate	24.27%	33.86%	35.25%	25.92%	20.49%	35.18%	28.55%	23.58%
Earnings Growth Rate	20.78%	68.56%	-92.39%	22.06%	19.44%	38.29%	21.76%	27.71%
Earnings								
Return on Assets	3.35%	1.23%	1.92%	2.95%	2.08%	3.19%	3.06%	2.61%
Net Interest Income to Earning Assets	7.37%	6.39%	7.76%	7.12%	5.25%	7.78%	8.15%	5.26%
Non-Interest Expenses to Total Assets	5.35%	6.20%	7.79%	5.41%	4.74%	5.29%	5.96%	4.68%
Liquidity								
Core Deposits to Total Deposits	77.39%	48.42%	63.87%	71.92%	66.05%	76.99%	76.29%	61.30%
Liquid Assets to Demand Liabilities	55.14%	45.44%	58.26%	52.97%	51.97%	54.49%	52.30%	55.06%
Gross Loans to Total Deposits	55.53%	64.80%	61.25%	57.22%	58.82%	56.17%	57.69%	56.74%

4.5 Discussion of the results

The results of regression analysis of fixed effects, random effects and panel least square estimates indicated the internal and external determinants are key influential factors in enhancing profitability of the commercial banks. To start with liquidity of the commercial banks is the key factor for the profitability of commercial banks, the positive coefficient indicates that when the level of liquidity increases the level of profit increase also. However the study is contradictory to the study made by Vodova (2010) and Guru (2006). The positive influence of liquidity were supported by Naceur (2003), Flamini (2009) , Huvenear (1994) and Thornton (1992), the study portrayed that the increase in liquidity enhances bank's capability in daily activities and increase the economic activities of the bank. Kosmiodou (2008) and Ghazali (1999) showed that the result of liquidity influence on profitability is mixed and they found the impact of liquidity is not straight forward as higher level of liquidity tends to be converted into current assets which are idle assets and therefore need to be balanced. When NIM and NOVX are regressed as the dependent variables they show that liquidity in terms of liquid asset to demand liabilities, core deposit to total funding have positive influence on profitability and gross loans to total deposit has a positive influence on profitability and the results was statistically significance at 95% confidence interval. Gram (2010) showed liquidity level increases the profitability of the banks, banks holding large liquid assets are expected to be more profitable, moreover the findings indicated the balance of maximum and minimum liquidity is the key factor for bank profitability.

Asset quality in terms of NPL to gross loan, large exposure to core capital , NPL net of provision to core capital and loans to total asset. Loan to total asset indicates positive influence on ROA, as loan is the greatest source of profit; the result is supported by Wasiuzzaman (2010), Hui (2012) and solovsova (2011) who indicated that the growth of loan tends to increase the profitability of commercial bank. NPL to Gross loan tends to decrease the level of profitability, the negative coefficients indicate for the extra increase in non-performing loans relatively to the gross loan tends to lower profitability of commercial banks but the result is contradictory with that pointed by Kosmodou (2008) who indicated that the increase in loan growth tends to lower profitability of commercial banks as there will be greater risks of loan default. Similar results was found when NOVX and NIM was used as the dependent variables, the findings indicated the negative impact of asset quality in influencing the dependent variables.

Capital adequacy represents the capital condition of the bank, it is represented by core capital to RWA, Core leveraging to average asset and total capital to RWA. The findings from the regression model indicate that capital adequacy in terms of core capital to average asset and core capital to RWA tend to decrease the profitability level while capital adequacy in terms of total capital to RWA tends to increase the level of profitability significantly. The findings is consistent with Naceur (2003), Kosmidou (2009), Kamau (2009), Mendes (2002) and Sufian(2008) who supported the hypothesis as capital tend to increase the profitability as the commercial banks lower the solvency costs. The negative influence of capital on profitability postulates that any additional capital tends to decrease the profitability level.

Expenditure in terms of overhead indicates negative relationship between profitability and overhead. As the increase in overhead tends to decrease the profitability level and the result was statistically significance when ROA was used as the dependent variable but insignificant in other dependent variables but both of them reveal the negative influence. The study is consistent with Sufian (2008) who indicated that the increase in overheads tend to decrease the profitability of commercial bank , however it was contradictory with Flamini (2009) and Naceur (2003) who indicated that the increase in overhead is associated with the increase in profitability. The pre assumption is that when the bank increases overhead it tends to expand in sales (revenue) and the costs are being reflected back to the customers.

Bank spread has postulated the positive coefficient in the determinant of commercial bank profitability, greater spread between the lending and deposit rate increases the profitability potential of the commercial banks, the result is consistent with Mc shore and Sharpe (1985), Allen (1988), Angbazo (1997), Chirwa (2003), Martiz Peria (2004). Demerguc-kunt and Huizinga (1999) indicated the greater spread is the result of the efficiency of the commercial banks.

Inflation referred as the general increase in price level and interest rate in the economy. The theory suggests that the increase in inflation increase the profitability of the commercial banks if the changes in price level are predicted and forecasted. In this study inflation has showed a positive influence on profitability, as the increase in inflation is expected to increase profitability of commercial bank. Meanwhile the increase in interest rate has positive influence on profitability as it increases the revenue of the bank.

Bank size as measured by the market share indicates that the bank size has no influence on profitability of commercial banks when NIM and NOVX are used as the dependent variables but it was statistically significance when ROA was used as the dependent variable. The result is consistent with Haffernan and Fu (2008) and Ling and Zhang (2008) who found that market share tends to increase the profitability of the bank because the large bank in terms of total asset tends to widen bank branches and increases customers hence greater profitability compared to the small bank with lower banking.

5.0 Conclusion

Tanzania is now in its third generation of financial sector reforms. With this it has attracted a number of players in the financial system and increased the competition of commercial banks. Once the commercial banks are profitable they will enhance efficiency and increase operational independence. Therefore examining the determinants of commercial banking profitability is crucial as they dominate the financial system because the development of a capital market is very low. The study confirms that the internal and external factors are significant in influencing the profitability of commercial banks. The empirical findings of this paper indicate that liquidity level, interest rate spread, and overhead expenditures are critical determinants of profitability. The commercial banks with a higher level of liquidity have shown greater profitability potential. Asset quality in terms of Non-performing loans and overheads expenses tend to decrease the profitability, but the other indicators of asset quality have shown the positive influence on profitability. Capital adequacy has mixed results; core capital to RWA and core capital to average assets tend to decrease the profitability potential while the total capital to RWA has a positive influence on profitability. Therefore it can be concluded that external and internal factors are critical components in influencing the profitability of the commercial banks Tanzania.

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APPENDIX

Dependent Variable: ROA
Method: Panel Least Squares
Date: 03/06/14 Time: 10:52
Sample: 2000 2011
Periods included: 12
Cross-sections included: 18
Total panel (unbalanced) observations: 216

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.055537	0.058828	-0.944064	0.3461
CCA	-0.211723	0.058294	-3.631986	0.0001
CCRWA	-0.129798	0.023987	-5.411181	0.0000
Ms	0.122506	0.029205	4.194693	0.0002
GLTD	-0.104737	0.019046	-5.499159	0.0038
IF	0.157842	0.124163	1.271247	0.2049
IT	0.510067	0.234447	2.175618	0.0086
LADL	0.102625	0.051430	1.995431	0.0292
LECC	-0.002097	0.002665	-0.786958	0.4321
NPCCC	-0.074548	0.044828	-1.662952	0.0976
NPLGL	0.122657	0.060200	2.037491	0.0007
Toexp	-0.000901	0.001907	-0.472654	0.6369

R-squared	0.716066	Mean dependent var	0.021657
Adjusted R-squared	0.683364	S.D. dependent var	0.061132
S.E. of regression	0.060103	Akaike info criterion	-2.738696
Sum squared resid	0.859751	Schwarz criterion	-2.569666
Log likelihood	354.3370	Hannan-Quinn criter.	-2.670666
F-statistic	2.781298	Durbin-Watson stat	2.209944
Prob(F-statistic)	0.000913		

Dependent Variable: ROA
Method: Panel Least Squares
Date: 03/06/14 Time: 11:02
Sample: 2000 2011
Periods included: 12
Cross-sections included: 18
Total panel (unbalanced) observations: 216

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.290087	0.158448	1.830800	0.0685
CCA	-0.200304	0.068021	-2.944746	0.0056
CCRWA	-0.105805	0.024470	-4.323865	0.0027
Ms	-0.104319	0.036516	-2.856802	0.0060
GLTD	0.059782	0.025547	2.340046	0.0202
IF	-0.237824	0.135322	-1.757467	0.0590
IT	-1.857741	0.959402	-1.936353	0.0341
LADL	0.203904	0.105513	1.932504	0.0496
LECC	0.000725	0.002777	0.261041	0.7943
NPCCC	-0.050282	0.048282	-1.041418	0.2988
NPLGL	0.102714	0.032089	3.200909	0.0001
Toexp	-0.001491	0.001929	-0.772948	0.4404

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.796222	Mean dependent var	0.021657
Adjusted R-squared	0.784767	S.D. dependent var	0.061132
S.E. of regression	0.057841	Akaike info criterion	-2.743210
Sum squared resid	0.729332	Schwarz criterion	-2.292463
Log likelihood	374.9013	Hannan-Quinn criter.	-2.561798
F-statistic	1.939996	Durbin-Watson stat	2.352848
Prob(F-statistic)	0.003385		

Dependent Variable: ROA
Method: Panel EGLS (Cross-section random effects)
Date: 03/06/14 Time: 11:06
Sample: 2000 2011
Periods included: 12
Cross-sections included: 18
Total panel (unbalanced) observations: 216
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.055537	0.056613	-0.980990	0.3276
CCA	-0.107173	0.056100	-1.913920	0.0213
CCRWA	-0.109798	0.023084	-4.756454	0.0016
Ms	0.100506	0.058482	1.718580	0.0782
GLTD	-0.400737	0.128330	-3.122707	0.0001
IF	0.157842	0.119490	1.320971	0.1878
IT	0.510067	0.221858	2.299069	0.0003
LADL	0.102625	0.031226	3.286524	0.0000
LECC	-0.002097	0.002564	-0.817740	0.4143
NPCCC	-0.074548	0.043141	-1.727998	0.0853
NPLGL	0.112657	0.021944	5.133840	0.0030
Toexp	-0.000901	0.001835	-0.491142	0.6238

Effects Specification	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	0.057841	1.0000

Weighted Statistics			
R-squared	0.736066	Mean dependent var	0.021657
Adjusted R-squared	0.683364	S.D. dependent var	0.061132
S.E. of regression	0.060103	Sum squared resid	0.859751
F-statistic	1.781298	Durbin-Watson stat	2.009944
Prob(F-statistic)	0.057913		

Unweighted Statistics			
R-squared	0.076066	Mean dependent var	0.021657
Sum squared resid	0.859751	Durbin-Watson stat	2.009944

Dependent Variable: NIM
Method: Panel Least Squares
Date: 03/06/14 Time: 11:08
Sample: 2000 2011
Periods included: 12
Cross-sections included: 18
Total panel (unbalanced) observations: 216

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.022611	0.337011	-0.067093	0.9466
CCA	0.174390	0.093954	1.856120	0.0039
CCRWA	-0.313863	0.137415	-2.284052	0.0000
Ms	0.231678	0.110023	2.102930	0.0006
GLTD	0.285800	0.109113	2.619302	0.0000
IF	0.977102	0.711304	1.373676	0.1708
IT	-0.560285	1.915974	-0.292428	0.7702
LADL	-0.102504	0.031110	-3.294889	0.0000
LECC	-0.003726	0.015264	-0.244070	0.8074
NPCCC	0.296724	0.256812	1.155413	0.2491
NPLGL	0.326428	0.111575	2.925637	0.0000
Toexp	0.000462	0.010926	0.042274	0.9663

R-squared	0.630980	Mean dependent var	0.108581
Adjusted R-squared	0.613807	S.D. dependent var	0.341965
S.E. of regression	0.344318	Akaike info criterion	0.752308
Sum squared resid	28.21608	Schwarz criterion	0.921338
Log likelihood	-82.03852	Hannan-Quinn criter.	0.820338
F-statistic	0.691723	Durbin-Watson stat	2.220232
Prob(F-statistic)	0.745974		

Dependent Variable: NIM
Method: Panel Least Squares
Date: 03/08/14 Time: 10:49
Sample: 2000 2011
Periods included: 12
Cross-sections included: 18
Total panel (unbalanced) observations: 216

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.798609	0.940997	0.848684	0.3970
CCA	0.280698	0.103964	2.699953	0.0079
CCRWA	-0.207050	0.145325	-1.424737	0.4621
Ms	0.353261	0.216864	1.628951	0.1632
GLTD	0.442130	0.151721	2.914098	0.0091
IF	7.414489	4.366955	1.697862	0.0910
IT	-9.117897	4.697731	-1.9409150	0.0110
LADL	0.111887	0.032741	3.417446	0.0009
LECC	-0.003382	0.016490	-0.205060	0.8377
NPCCC	0.208184	0.286741	0.726037	0.4686
NPLGL	0.101370	0.042408	2.390350	0.0122
Toexp	0.001709	0.011456	0.149206	0.8815

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.616587	Mean dependent var	0.108581
Adjusted R-squared	0.609036	S.D. dependent var	0.341965
S.E. of regression	0.343507	Akaike info criterion	0.819816
Sum squared resid	25.72336	Schwarz criterion	1.270563
Log likelihood	-70.47694	Hannan-Quinn criter.	1.001228
F-statistic	0.928072	Durbin-Watson stat	2.414854
Prob(F-statistic)	0.580614		

Dependent Variable: NIM
Method: Panel EGLS (Cross-section random effects)
Date: 03/08/14 Time: 10:50
Sample: 2000 2011
Periods included: 12
Cross-sections included: 18
Total panel (unbalanced) observations: 216
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.022611	0.336217	-0.067251	0.9464
CCA	0.274390	0.133167	2.060495	0.0235
CCRWA	-0.213863	0.127091	-1.682754	0.2195
Ms	0.331678	0.119764	2.769429	0.0015
GLTD	0.285800	0.108856	2.625486	0.0014
IF	1.977102	0.709629	2.786106	0.0098
IT	-0.560285	0.211460	-2.64960	0.0007
LADL	-0.102504	0.031037	-3.30263	0.0000
LECC	-0.003726	0.015228	-0.244646	0.8069
NPCCC	0.296724	0.256207	1.158141	0.2480
NPLGL	0.206428	0.101548	2.032812	0.0020
Toexp	0.000462	0.010900	0.042374	0.9662

Effects Specification	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	0.343507	1.0000

Weighted Statistics

R-squared	0.630980	Mean dependent var	0.108581
Adjusted R-squared	-0.613807	S.D. dependent var	0.341965
S.E. of regression	0.344318	Sum squared resid	28.21608
F-statistic	0.691723	Durbin-Watson stat	2.220232
Prob(F-statistic)	0.745974		

Unweighted Statistics

R-squared	0.030980	Mean dependent var	0.108581
Sum squared resid	28.21608	Durbin-Watson stat	2.220232

Dependent Variable: NOVX
Method: Panel Least Squares
Date: 03/06/14 Time: 12:58
Sample: 2000 2011
Periods included: 12
Cross-sections included: 18
Total panel (unbalanced) observations: 216

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.036734	0.041793	0.878947	0.3803
CCA	0.100715	0.041414	2.431997	0.0002
CCRWA	0.107446	0.037041	2.900731	0.0000
Ms	0.033818	0.013644	2.478597	0.0139
GLTD	0.026077	0.013531	1.927210	0.0551
IF	-0.154573	0.088209	-1.752347	0.0810
IT	0.341091	0.137601	2.478841	0.0010
LADL	-0.106309	0.030858	-3.445104	0.0000
LECC	-0.001903	0.001893	-1.005134	0.3159
NPCCC	-0.011373	0.031847	-0.357108	0.7213
NPLGL	-0.100445	0.030435	-3.300312	0.0000
Toexp	0.000463	0.001355	0.342027	0.7326

R-squared	0.633618	Mean dependent var	0.077344
Adjusted R-squared	0.620340	S.D. dependent var	0.043140
S.E. of regression	0.042699	Akaike info criterion	-3.422467
Sum squared resid	0.433925	Schwarz criterion	-3.253437
Log likelihood	439.8084	Hannan-Quinn criter.	-3.354438
F-statistic	1.469981	Durbin-Watson stat	2.677313
Prob(F-statistic)	0.143485		

Dependent Variable: NOVX
Method: Panel Least Squares
Date: 03/06/14 Time: 13:03
Sample: 2000 2011
Periods included: 12
Cross-sections included: 18
Total panel (unbalanced) observations: 216

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.315744	0.086997	-3.629381	0.0004
CCA	0.102878	0.037347	2.754653	0.0000
CCRWA	0.091581	0.043436	2.108412	0.0002
Ms	0.029513	0.020049	1.472011	0.1425
GLTD	-0.103218	0.044027	-2.344425	0.0002
IF	0.802901	0.403732	1.988699	0.0480
IT	1.993705	0.526764	3.784814	0.0002
LADL	-0.104372	0.033027	-3.160202	0.0070
LECC	0.000178	0.001525	0.116582	0.9073
NPCCC	-0.020910	0.026510	-0.788776	0.4311
NPLGL	0.100646	0.031147	3.231322	0.0000
Toexp	0.000716	0.001059	0.676080	0.4997

Dependent Variable: NOVX
Method: Panel EGLS (Cross-section random effects)
Date: 03/06/14 Time: 13:04
Sample: 2000 2011
Periods included: 12
Cross-sections included: 18
Total panel (unbalanced) observations: 216
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.159637	0.069566	-2.294771	0.0226
CCA	0.129800	0.046094	2.815984	0.0098
CCRWA	0.001199	0.013338	0.089898	0.9284
Ms	0.035873	0.017765	2.019349	0.0446
GLTD	0.105178	0.043307	2.428660	0.0275
IF	0.177780	0.211050	0.842358	0.4004
IT	1.258570	0.417589	3.013895	0.0029
LADL	-0.104260	0.033005	-3.158913	0.0081
LECC	5.23E-05	0.001509	0.034646	0.9724
NPCCC	-0.015883	0.025819	-0.615183	0.5390
NPLGL	0.100642	0.041130	2.446924	0.0705
Toexp	0.000724	0.001053	0.687893	0.4922

Effects Specification	S.D.	Rho
Cross-section random	0.034322	0.5387
Idiosyncratic random	0.031758	0.4613

Weighted Statistics

R-squared	0.784486	Mean dependent var	0.020018
Adjusted R-squared	0.742172	S.D. dependent var	0.032638
S.E. of regression	0.031950	Sum squared resid	0.242957
F-statistic	1.996659	Durbin-Watson stat	2.240606
Prob(F-statistic)	0.029450		

Unweighted Statistics

R-squared	-0.087691	Mean dependent var	0.077344
Sum squared resid	0.504042	Durbin-Watson stat	2.240606

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